

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims

Claims 1-18 (cancelled)

Claim 19 (new): A quality control method for a direct methanol fuel cell in which a fuel electrode and an air electrode, each of which contains an electrode catalyst consisting of at least a noble metal or carbon supporting the noble metal and a proton conductive polymer solid electrolyte are provided on respective sides of a proton conductive polymer solid electrolyte membrane, wherein the direct methanol fuel cell is made capable of generating electricity by being supplied with methanol and water to the fuel electrode and being supplied with oxygen in the air to the air electrode, and further wherein a characteristic of elution of the fuel electrode material into the fuel is evaluated.

Claim 20 (new): The quality control method for a direct methanol fuel cell according to claim 19, wherein the elution characteristic is evaluated by detecting a change in the characteristic of the fuel electrode associated with the elution of the fuel electrode material into the fuel when the fuel electrode is brought into contact with the fuel whose concentration exceeds 2 M or the fuel whose temperature exceeds 80°C.

Claim 21 (new): An operational method of using a direct methanol fuel cell in which a fuel electrode and an air electrode, each of which contains an electrode catalyst consisting of at least a noble metal or carbon supporting the noble metal and a proton conductive polymer solid electrolyte, are provided on respective sides of a proton conductive polymer solid electrolyte membrane, wherein the direct methanol fuel cell is made capable of generating electricity by being supplied with methanol and water to the fuel electrode and being supplied with oxygen in the air to the air electrode, wherein, when the elution of the fuel electrode material into the fuel is detected, elution detection is fed back so that the fuel concentration is decreased, or the operating temperature is lowered, or an output of the fuel cell is limited.

Claim 22 (new): The operational method of using a direct methanol fuel cell according to claim 21, wherein a window through which a color of the fuel is observed or a sensor for detecting the color of the fuel is provided, so that the elution of the fuel electrode material into the fuel is detected by a change in the color of the fuel.

Claim 23 (new): A direct methanol fuel cell in which a fuel electrode and an air electrode, each of which contains an electrode catalyst consisting of at least a noble metal or carbon supporting the noble metal and a proton conductive polymer solid electrolyte are provided on respective sides of a proton conductive polymer solid electrolyte membrane, wherein the direct methanol fuel cell is made capable of generating electricity by being supplied with methanol and water to the fuel electrode and being supplied with oxygen in the air to the air electrode, further comprising:

means for detecting or inputting the elution of the fuel electrode material into the fuel; and

means for, when the detection or inputting is done, feeding back the detection of elution so that the fuel concentration is decreased, or the operating temperature is lowered, or an output of the fuel cell is limited.

Claim 24 (new): The direct methanol fuel cell according to claim 23, wherein a window through which a color of the fuel is observed or a sensor for detecting the color of the fuel is provided.

Claim 25 (new): A direct methanol fuel cell in which a fuel electrode and an air electrode, each of which contains an electrode catalyst consisting of at least a noble metal or carbon supporting the noble metal and a proton conductive polymer solid electrolyte are provided on respective sides of a proton conductive polymer solid electrolyte membrane, wherein the direct methanol fuel cell is made capable of generating electricity by being supplied with methanol and water to the fuel electrode and being supplied with oxygen in the air to the air electrode, wherein at least the fuel electrode is heat-treated by at least one of pressure joining thereof to the solid electrolyte membrane at 150-250°C, drying at 120-250°C

in a state where the proton conductive polymer solid electrolyte was mixed with the electrode, and irradiation under heating.

Claim 26 (new): A method for manufacturing a direct methanol fuel cell in which a fuel electrode and an air electrode, each of which contains an electrode catalyst consisting of at least a noble metal or carbon supporting the noble metal and a proton conductive polymer solid electrolyte are provided on respective sides of a proton conductive polymer solid electrolyte membrane, wherein the direct methanol fuel cell is made capable of generating electricity by being supplied with methanol and water to the fuel electrode and being supplied with oxygen in the air to the air electrode, further comprising:

a step of heat-treating the fuel electrode by at least one of pressure-joining thereof to the solid electrolyte membrane at 150-250°C, drying at 120-250°C in a state where the proton conductive polymer solid electrolyte was mixed with the electrode, and irradiation under heating.

Claim 27 (new): The method for manufacturing a direct methanol fuel cell according to claim 26, wherein in the heat treatment step, the fuel electrode is pressure-joined to the solid electrolyte membrane at a temperature of 170-210°C.

Claim 28 (new): The method for manufacturing a direct methanol fuel cell according to claim 26, wherein the heat treatment step is conducted in a vacuum or an inert gas.